

**FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.**

[PRICE 6D.]

[illegible]



## GEOLOGICAL SOCIETY.

Feb. 21.—The President, Mr. W. A. Smith, in the chair.

The following papers were read:—1. "Some remarks on the fossils observed in the course of the Humber River, Surrey, in the year 1861," by Mr. Smith. The fossils were carried through a series of strata, formed by the escape of the river from the sea. The fossils were of the Silurian, Devonian, and Carboniferous periods. The fossils were of the Silurian, Devonian, and Carboniferous periods. The fossils were of the Silurian, Devonian, and Carboniferous periods.

2. "Some remarks on the White Limestone of Gales and Vids," by Captain Smith. The fossils were carried through a series of strata, formed by the escape of the river from the sea. The fossils were of the Silurian, Devonian, and Carboniferous periods. The fossils were of the Silurian, Devonian, and Carboniferous periods. The fossils were of the Silurian, Devonian, and Carboniferous periods.

3. "Remarks on the Silurian," by Mr. J. S. Dyer. The author considers the fossils of this Silurian group of extinct vegetables as mostly made of the Silurian, Devonian, and Carboniferous periods. The fossils were of the Silurian, Devonian, and Carboniferous periods. The fossils were of the Silurian, Devonian, and Carboniferous periods.

4. "On a Fossil Crustacean from New Holland," by Professor Thomas Hall. This, the only fossil crustacean as yet found in Australia, was preserved by Professor Thomas Hall. The fossils were of the Silurian, Devonian, and Carboniferous periods. The fossils were of the Silurian, Devonian, and Carboniferous periods.

## INSTITUTION OF CIVIL ENGINEERS.

March 1.—The President, Mr. J. T. Smith, in the chair.

The first paper read was a description, by Mr. J. T. Smith, of the bridge over the river Widdow, at Allington. This bridge, which was erected at the expense of Mr. Widdow, of Blackadder, from the designs of Messrs. Stevenson and Sons, of Edinburgh, consists of two arches of 75 ft. span each, with a central span of 11 ft. 6 in., the center pier being 25 ft. 6 in. long, and 16 ft. 6 in. high, making the distance between the faces of the abutments 160 ft. It was constructed of red sandstone, and the abutments were built up with the greater part of the masonry being ashlar. The total cost of the bridge was stated to be £1000.

A paper by Mr. F. Nash was then read, describing a new kind of girder composed of a number of diagonal bars of wrought iron, riveted against each other, with cast-iron transverse, these latter supporting the pressure, and the former the tension. This mode of construction has been recently introduced in France for bridges, and the paper, after describing a number of preliminary experiments on small girders, gave the details of the girder, to which four girders, placed side by side, with a bearing of 7 ft. 6 in., had been subjected by order of M. Trélat, the Minister of Public Works, Paris. From this it appeared, that with a load of fifty tons, the deflection in the center was 1 1/2 inch, and that the girders retained their original position on the weight being removed, after bearing it for a month. In order to test the effect of a sudden shock, a cast loaded with 45 tons of iron was caused to break down suddenly in the center of the bridge, without producing any perceptible effect beyond cracking the bearing plates. The weight of these four girders was stated to be 50 tons.

An account of the building of Wellington bridge, over the River Aire, at Leeds, by Mr. J. Timperley, was then read. This bridge was erected from the designs of the late Mr. Roane, about twenty years since. It crosses a river where it is 100 ft. wide, and 6 ft. deep. It consists of a segmental arch of 100 ft. span, with a central pier of 15 ft. high, constructed of stone from the quarries of Bramley Hall, which are about four miles from the bridge. The abutments are built in retaining courses, except the external faces, which are horizontal, the whole being well bonded together. The total quantity of masonry is 60,000 cubic feet. The method of forming the foundations, as well as the other parts and center, was given in detail, and it was stated that the total cost of the bridge was only £1000.

Mr. G. Roane made some observations on the ancient arches, of which there have been discovered by the recent excavations of the Romans, at the site of the bridge. The arches were of the Roman period, and the bridge was built on the site of the Roman arches. The bridge was built on the site of the Roman arches. The bridge was built on the site of the Roman arches. The bridge was built on the site of the Roman arches.

## LITERARY NOTICES.

On the Construction of Bridges with Cast-iron Members.—We have just received a highly interesting work from the pen of Mr. John Hughes, C.E., F.R.S.E., which has been forwarded to us for review. The importance of the subject treated, the plan of the work, and the manner in which it is written, all commend it to the attention of the public. The work is written in a clear and concise manner, and is well illustrated with diagrams and drawings. The work is written in a clear and concise manner, and is well illustrated with diagrams and drawings.

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## PRODUCTION OF IRON AND STEEL IN WESTERN AUSTRALIA.

Fully believing that any information leading to the natural resources of our colonies, must prove generally acceptable, we have great pleasure in giving publicity to the following interesting details; and, we would hardly add, that we are obliged to our intelligent correspondent ("A. A."), to whom we are indebted for their transmission, and any additional information he, or others, may furnish, will prove equally acceptable.

We learn, from the data afforded us, that it was but a short time since that the first attempt at manufacturing steel was made in Western Australia, and, since that, an experiment for the production of steel is recorded—proofs of such progress in advancing towards a conspicuous position in the scale of more matured countries cannot prove otherwise than extremely gratifying, not only to the colonists themselves, but also to the numerous parties interested—but how astonished will our readers be, to find that iron and steel have been produced from ore found abundantly in the colony.

A paper describing of certain experiments in the manufacture of these valuable metals was read by Mr. Nash at the meeting of the Agricultural Society, held in October last. We have not yet seen the minutes of that meeting, but the following abstract from Mr. Nash's report has reached us. It is stated that iron ore in large quantities is to be found in the colony to any extent, yielding a larger percentage of metal than the average of ores in England; and that gentleman's property a mass of iron ore, included in limestone, 400 yards in length, and about 40 in breadth, was lately discovered; its depth in the springs, which rise in the solid ore, was six feet, but it was apparently a much greater depth. The following experiments on a very contracted scale, and with a small portable forge, are reported:—1. 100 grains of raw iron ore, with 50 per cent. of charcoal, heated up in a crucible of blue clay, and then in the large, twenty minutes of which in a white heat—50 per cent. of cast-iron; 100 grains of cast-iron heated half an hour with 20 per cent. of iron—9 per cent. of wrought-iron; 100 grains of wrought-iron, heated one hour, with 50 per cent. of iron—cast-iron.

2. 100 grains of raw iron ore, with 25 per cent. of charcoal, produced a small quantity of pale green glass, and 25 per cent. of iron. 3. 100 grains of raw iron ore, with charcoal only—54 per cent. of iron. 4. 10 lbs. of ore run easily into a black lava, but for want of sufficient power only a few grains of iron were produced in white enamel.—*Alas!* The ore does not appear to contain either sulphur or arsenic, either of which would render it brittle. The paper stated also that in the neighbourhood of the Williams River, iron ore is found in small quantities, and, in some instances, spherical masses on the surface of the ground, yielding 2 or 3 per cent. more metal than the above; it is described as being black, and very hard, and brings sparks from steel. In several other parts of the colony iron ore is found lying on the surface. We are enabled to give the above outline of Mr. Nash's report, but shall enter more into the details of the subject on the receipt of further advice. Mr. Nash deserves great credit for bringing so important a subject forward, and, we are led to believe, has added another instance of his indefatigable zeal in behalf of cultivation and production, to his former valuable services.

5. 100 grains of raw iron ore, with 50 per cent. of charcoal, heated up in a crucible of blue clay, and then in the large, twenty minutes of which in a white heat—50 per cent. of cast-iron; 100 grains of cast-iron heated half an hour with 20 per cent. of iron—9 per cent. of wrought-iron; 100 grains of wrought-iron, heated one hour, with 50 per cent. of iron—cast-iron.

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## LEAD AND COPPER TRADES OF AMERICA.

We extract the following particulars from an American paper, with which we have been favoured by a correspondent.—There are few topics connected with western trade of more interest than that which regards our mineral resources. Last year, we exported lead to England, China, and France—in small quantities, compared with what we have to spare, it is true, but enough to show that the current of trade in that particular is totally changed. We look to the *St. Louis Republic*, a valuable article, giving a view of the lead trade at Galena and Dubuque. The table gives the following as the amount of lead shipped from the Upper Mississippi:—In 1841, lead to pigs, 152,934; in 1842, 164,339; in 1843, 164,339; in 1844, 164,339; in 1845, 164,339; in 1846, 164,339; in 1847, 164,339; in 1848, 164,339; in 1849, 164,339; in 1850, 164,339; in 1851, 164,339; in 1852, 164,339; in 1853, 164,339; in 1854, 164,339; in 1855, 164,339; in 1856, 164,339; in 1857, 164,339; in 1858, 164,339; in 1859, 164,339; in 1860, 164,339; in 1861, 164,339; in 1862, 164,339; in 1863, 164,339; in 1864, 164,339; in 1865, 164,339; in 1866, 164,339; in 1867, 164,339; in 1868, 164,339; in 1869, 164,339; in 1870, 164,339; in 1871, 164,339; in 1872, 164,339; in 1873, 164,339; in 1874, 164,339; in 1875, 164,339; in 1876, 164,339; in 1877, 164,339; in 1878, 164,339; in 1879, 164,339; in 1880, 164,339; in 1881, 164,339; in 1882, 164,339; in 1883, 164,339; in 1884, 164,339; in 1885, 164,339; in 1886, 164,339; in 1887, 164,339; in 1888, 164,339; in 1889, 164,339; in 1890, 164,339; 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